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08/350,168	11/30/94	YAMAZAKI	S 07561146

NGUYEN, T EXAMINER

E5M1/0731

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ART UNIT	PAPER NUMBER
2515	6

DATE MAILED: 07/31/95

This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

☒ This application has been examined ☐ Responsive to communication filed on _____ ☐ This action is made final.

A shortened statutory period for response to this action is set to expire 3 month(s), — days from the date of this letter.
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☒ Notice of References Cited by Examiner, PTO-892.
2. ☒ Notice of Draftsman's Patent Drawing Review, PTO-948.
3. ☒ Notice of Art Cited by Applicant, PTO-1449.
4. ☐ Notice of Informal Patent Application, PTO-152.
5. ☐ Information on How to Effect Drawing Changes, PTO-1474.
6. ☐ _____.

Part II SUMMARY OF ACTION

1. ☒ Claims 1-25 are pending in the application.
   Of the above, claims _____ are withdrawn from consideration.
2. ☐ Claims _____ have been cancelled.
3. ☐ Claims _____ are allowed.
4. ☒ Claims 1-25 are rejected.
5. ☐ Claims _____ are objected to.
6. ☐ Claims _____ are subject to restriction or election requirement.
7. ☐ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.
8. ☐ Formal drawings are required in response to this Office action.
9. ☐ The corrected or substitute drawings have been received on _____. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable; ☐ not acceptable (see explanation or Notice of Draftsman's Patent Drawing Review, PTO-948).
10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on _____. has (have) been ☐ approved by the examiner; ☐ disapproved by the examiner (see explanation).
11. ☐ The proposed drawing correction, filed _____, has been ☐ approved; ☐ disapproved (see explanation).
12. ☒ Acknowledgement is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☒ been received ☐ not been received ☐ been filed in parent application, serial no. _____ ; filed on _____.
13. ☐ Since this application apppears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.
14. ☐ Other

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EXAMINER'S ACTION

PTOL-326 (Rev. 2/93)

Claim Rejections - 35 USC § 112

1. Claims 4,5,6,7,9,10,12,15,18,25 rejected under 35 U.S.C. § 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. MPEP § 706.03(f).

Regarding claims 4,5,9,10, the structural relationships between the CPU, memory and the rest of the claimed electric device are not defined.

Regarding claims 6,7,12,15,18, the structural relationship between the glass and the rest of the claimed electric device, particularly the substrate, is not defined. To overcome this rejection, it is suggested that the phrase "the substrate has glass" be changed to "the substrate comprises a glass substrate".

Regarding claim 25, the structural relationship between the claimed "another one thin film transistor" and the rest of the claimed electric device is not defined.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

3. Claims 1,4,5,17,21 are rejected under 35 U.S.C. § 102(e) as anticipated by or, in the alternative, under 35 U.S.C. § 103 as obvious over Nagae'175.

The above claims are anticipated by Nagae's fig. 4-7,9 and accompanying text (column 10, lines 41+) which disclose an active matrix LCD comprising a pair of substrates opposite each other as shown in fig. 5,6,7, wherein an active matrix circuit (131), driving means (132), and a semiconductor IC chip (133,134) for controlling the driving means are all integrated on one of the substrates. The active matrix circuit includes for each pixel a TFT acting as a switching device, and the driving means includes X and Y drivers having TFTs. The TFTs can be arranged as shown in fig. 4B. The IC chip has a memory (133), and a control circuit (134). Although Nagae does not specifically disclose that the control circuit (134) is a CPU, it is conventional (as evident by the cited reference Yamamoto'526, col.15, lines 21-25) to use one as a control circuit for processing the necessary control timing signals to drive the various components of the active matrix LCD in a speedy manner.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

> Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

5. Claims 2,3,6-16,18-20,22-25 are rejected under 35 U.S.C. § 103 as being unpatentable over Nagae'175 in view of Sarma'840 and Mase'156.

Regarding the above claims, Nagae discloses the claimed invention except for: a) the substrate on which the active matrix circuit lays being made of glass; b) the IC chip being connected with the driving means by a wire bonding or COG; c) the TFT of the driving means being of a complementary type, P-type TFT, or an N-type TFT. Sarma's figures and accompanying text disclose methods for manufacturing TFTs, with substantially the same structure, of both the drivers and active matrix circuit on a single glass substrate. Mase's fig.2 and accompanying text disclose the use of wire bonding (col.1, lines 25-28) and COG methods (fig.2) to connect an IC chip to an LCD glass substrate. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Nagae's LCD device as follows: a) Fabricating the display glass substrate with TFTs for both the active matrix circuit and driving circuits on the glass substrate as disclosed in Sarma'840; b) Fabricating the semiconductor IC chip having the CPU and memory on a separate semiconductor substrate and connecting the chip to the driving circuits on the display glass substrate by wire bonding or COG as disclosed by Mase'156; c) The TFTs for the driving circuits can be of N-type, P-type, or complementary type. The modification would have been

obvious for the following reasons:

- The fabrication of high mobility TFTs for both the active matrix circuit and the drivers according to Sarma's methods enables the drivers to operate in the several megahertz frequency range needed for driving high resolution active matrix displays (Sarma's abstract). Furthermore, the fabrication of the active matrix circuit and drivers on a glass substrate, as done by Sarma, rather than on a semiconductor substrate, as done by Nagae, is less expensive, and it decreases the circuit density and further cost required in mounting both an IC chip and the drivers on a separate semiconductor substrate.

- The fabrication of an IC chip on a separate semiconductor substrate and wire bonding the chip to the drivers on the glass substrate of an LCD device is conventional in the art (column 1, lines 25+). The chip can also be connected to the drivers on the glass substrate by COG to allow for easy replacement of faulty IC chips (Mase's Summary of the Invention).

- The transistors in drivers are conventionally used as gating means to power up/down the scanning bus lines of the active matrix circuit, depending on the pixel or pixels to be activated/deactivated. Whether N-type, P-type, or complementary-type transistors are used depend on a desired application since they are art recognized equivalent for their use as gating means.

The following prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Kawasaki'636 discloses an LCD being manufactured with the COG

method; Kishino'041 discloses a field emission cathode with driver ICs mounted on a glass substrate; Kawaguchi'226 discloses an active matrix LCD being manufactured with the COG method; Yamamoto'526 discloses an LCD device in which the active matrix circuit and peripheral circuitries are integrated on a single semiconductor substrate; Yamazaki'752 discloses a method of driving an active matrix LCD.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tiep Nguyen whose telephone number is (703) 305-3496 and fax phone number is (703) 308-7725.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-1615.

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